CHEMISTRY SEMINAR

Navigating Decoherence: Molecular Approaches to Quantum Information

3:15 pm
March 6
RNS 310

Modeling the electronic structure of molecules is a challenging problem in computational chemistry, yet it remains computationally prohibitive for large-scale systems. Quantum computing promised a solution, but practical applications are currently out of reach due to decoherence, or the loss of quantum information due to environmental noise. Rather than waiting for perfect hardware, our research seeks creative paths forward using today's devices. This seminar will detail our group’s progress in two areas: (1) using noisy quantum processors to simulate open quantum system dynamics, and (2) investigating molecular-level strategies to engineer more resilient qubits.

Kade Head-Marsden is an assistant professor in the Department of Chemistry at the University of Minnesota. She completed her undergraduate degree in mathematics and chemistry at McGill University, and a PhD in theoretical chemistry at the University of Chicago with David Mazziotti. She was a postdoc at Harvard University before starting her faculty career at Washington University in St Louis in 2022. She moved her research group to Minneapolis in 2024, where they are continuing to focus on research at the intersection of open quantum systems, electronic structure, and quantum computing.

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